



Financing innovation

MARC LLOVERAS

This article intends to analyse the innovation process from the financing perspective, concretely the benefits companies draw from public aid for research, development and innovation (R&D&I).

Innovation and risk

Apart from the main mission specified by each company, a necessary goal is also that of creating wealth, to which R&D&I projects are to contribute.

Before starting any major project, companies therefore need to make a cost-benefit analysis to it. Such an analysis shall include the following elements:

- ▶ Required resources (investment and expenditure, staff, time, etc.)
- ▶ An estimate of the future benefit for the company
- ▶ An analysis of technical, legal, intellectual property or any other risk that may affect the result of the project
- ▶ An overall assessment of the project in order to obtain the estimated result for the company in terms of internal rate of return, net current value or any other adequate assessment method. The assessment method needs to include the risk associated to the project (e.g. through a specific discount rate or option analysis).
- ▶ An analysis of the affection of global risks and the joint risk of R&D&I projects at the company. A project portfolio with diversified risk reduces the overall risk without diminishing profitability.

Most companies, especially SMEs, do not have such processes systematised, which often causes their projects to fail due to a lack of previous analysis.

R&D&I investment

Generally speaking, a company's R&D&I budget is mostly made up of current expenditure

though it may include a part of fixed assets (equipment, patents, licences, etc.). In any case, if a company wishes to have a sound balance, it should be financed through:

- ▶ Positive results of the exercise; it is the most sustainable option as long as the company keeps a net cash surplus
- ▶ Capital enlargement by current or new partners

These alternatives do not increase the financial risk. Additionally, a company also can:

- ▶ Increase leveraging as long as its repayment capacity allows to do so. The repayment deadlines of additional debt should bear a relation to a realistic forecast of project benefits.
- ▶ Collaborate with other companies to carry out joint projects, thus reducing the individual cost for each company or implementing projects with a wider scope.

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Since these possibilities are usually limited by different factors, public aid can help the company increase its investment volume or raise significantly its amount of projects.

Public aid for R&D&I

At its meeting in Barcelona in March 2002, the European Council agreed to increase the European Community's overall R&D&I expenditure to 3% of GDP by 2010. It was further decided that one third of new investment should come

Chart 1. Public R&D&I project financing

	Small companies	Medium-sized companies	Big companies
Industrial research ¹	70%	60%	50%
Experimental development ²	45%	35%	25%
Innovation in processes ³ and organisation ⁴	35%	25%	15%

Source: Own research

- ▲ The percent rates shown on the chart relates to the maximum intensity of public aid for financing R&D&I projects at companies.

from the private sector. In this sense, it was agreed that economic efficiency could be increased through state aid, thus contributing to sustainable growth and employment.

So despite not complying with Article 87 of the EC Treaty as to public aid, R&D&I funding is allowed as long as it contributes to increasing overall R&D&I and competitive distortion is not considered contrary to the common interest.

This regulation included in the community framework⁵ allows for a high degree of aid.⁶ Companies can finance a big part of R&D&I projects with public aid. This percentage relates to the maximum intensity of aid⁷, which will be dealt with further on.

At the same time, the community framework requires that aid lines to companies

- ▶ serve purposes of common interest (e.g. growth, job creation, improvement of environmental conditions),
- ▶ have an encouraging effect and thus change the behaviour of the company,
- ▶ limit the effect of competitive distortion so the overall balance is positive.

The community framework further states that companies receiving aid improve their position

compared to the rest.⁸ Companies therefore need to consider that if their competitors innovate and have access to public aid while they do not, their competitive position may deteriorate.

The best known types of public aid are subsidies, but there are other mechanisms.

The second point limits the project types eligible for funding: no subsidy may be given for those activities the company would pursue without public aid.

State aid to R&D&I is to induce a change of behaviour in companies that leads to an increase of their R&D&I activity and encourages projects that otherwise would not be done or at least be subject to more restrictions. That is, companies should increase their R&D&I activities as to volume, scope, overall investment and implementation rate.

Aid types

The best known types of public aid are subsidies, but there are other mechanisms. The main aid types are the following:

- ▶ Subsidies

- ▶ Refundable advances: a loan for a project, paid in one or more instalments and whose repayment conditions depend on the project result
- ▶ Loans at better conditions than on the market, basically with a bonus on interest rates
- ▶ Guarantees: the state guarantee allows the company to obtain a loan at better conditions than on financial markets⁹
- ▶ Risk capital: there may be aid for investors, risk capital funds or companies receiving investment; their purpose is to improve capital market efficiency of SMEs¹⁰

In Catalonia, companies may opt for different kinds of funding given directly by the Catalan and Spanish governments as well as the European Union.

A strong increase of funding in the form of financial instruments and a concentration of subsidies on medium-sized and big projects the patterns observed in public R&D&I aid.

The aid a company is considered to obtain is calculated in different ways for each instrument. In the case of subsidies, it is the sum actually received by the company. In the case of subsidised loans, the company obtains an implicit aid. This aid amounts to the difference between the interest rate under market conditions and the actual interest paid by the company for this loan. This sum is called gross equivalent aid. The loan the company obtains is higher than that.

We are currently observing two trends in setting out public R&D&I aid:

- ▶ A strong increase of funding in the form of financial instruments (loans, guarantees and risk capital)

- ▶ Concentration of subsidies on medium-sized and big projects, especially joint projects in which different types of companies and technology and research centres participate

There are several factors leading to these trends but we could point out the need for increasing funding efficiency and improving access of innovating companies to financing.

Access to financing

One of the points considered crucial in cohesion policy is to improve access of SMEs to financing.¹¹

The Government of Catalonia, more precisely the Ministry of Innovation, Universities and Enterprise, through CIDEM, as well as the Ministry of Economy and Finance and the Ministry of Employment, is implementing an important package of joint initiatives to improve access of SMEs to financing, which includes risk capital funds, loans, guarantees and programmes for private investors.

CIDEM will create new long-term loan schemes for R&D&I projects envisaging from strategic to more modest projects, which will, together with the subsidies already given by this body, complete the offer to finance R&D&I projects.

The Administration takes over a certain cost when setting out these financial instruments. This cost can be an interest rate bonus or, in other cases, some kind of guarantee. Funding in the form of long-term loans usually includes an interest bonus and is therefore offered at a lower rate than a company may obtain under market conditions.¹²

Nevertheless, subsidised loans require the usual guarantees. It is still frequent that some SMEs do not take them because cannot produce the guarantee in spite of mechanisms ensuring ac-

cess in many cases. There are even companies that, due to their inability to obtain a guarantee, make arrangements with financial institutions from which they obtain a part of their financing in exchange of using a part of the awarded loan as a guarantee.

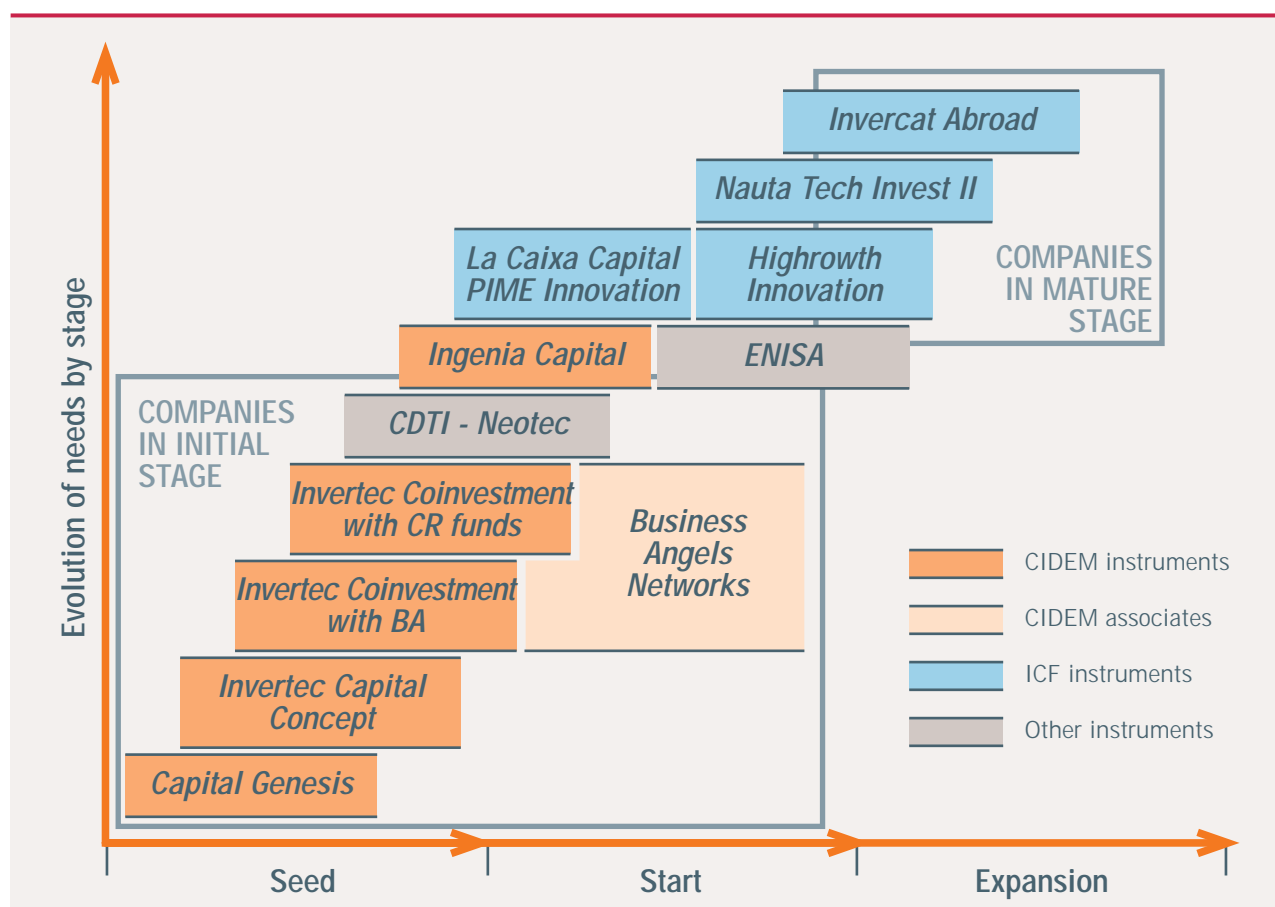
Aid in the form of guarantee is usually given through mutual guarantee societies. The very existence of aid does not mean that loans can be given to companies without repayment capacity, but funding shall allow the mutual guarantee society to keep a higher delinquency rate than a

financial institution may consider adequate without public aid. This ratio must not be excessive as this could pose a risk to the society itself.

Risk capital and business angels

In some cases, companies need to increase their capitalisation to take on high-risk projects, with capital coming either from existing or new partners.

Graph 1. 2008 financing scheme



Source: Own research

- ▲ The graph shows some of the publicly funded capital or quasi-capital financing instruments for innovating companies.

The capital market for SMEs in Catalonia has not reached a degree of development comparable to other leading countries yet. Developing this market is considered a key factor to encourage the creation and growth of young innovating companies.

This market basically consists of two kinds of players:

- ▶ Risk capital societies drawing financial resources from private or institutional investors with the aim of investing temporarily in unlisted companies. Some financial institutions also have created instruments to invest in young companies.
- ▶ Business angels investing own resources directly in unlisted companies. They can join to form networks, organised groups investing individually or jointly. There are currently nine business angels networks in Catalonia.¹³

Business angels and risk capital funds usually look for growing companies. Some are highly specialised and invest only in technology companies while others have a rather general focus and spread their investments over different industries.

There are over forty risk capital operators in Catalonia investing in different SME types

This capital market for SMEs has developed considerably so it can be said that entrepreneurs creating innovating companies with a strong growth never had as many financing alternatives as they do now. However, there are still uncovered segments that are going to be progressively served by private initiative if they yield a profitability rate adjusted to their risk. The role the Government of Catalonia plays through CIDEM and the Catalan Institute of Finance is important to encourage the creation of new funds and instruments to improve this offer.

Graph 1 shows some of the publicly funded capital or quasi-capital financing instruments for innovating companies.

Effects of public aid on R&D&I

The benefits of public aid for companies is apparent, although it is also true that managing projects associated to public aid often causes additional work.

If we search for R&D&I funding on the CIDEM Funding and Subsidies Database¹⁴ we will find 82 entries. Companies in Catalonia can opt for funding by the Catalan and Spanish Governments as well as the European Commission, each with its distinct conditions, processes and deadlines.

Besides, given the quick and constant change of target priorities, the change in funding usually goes at a similar pace in order to satisfy these needs.

In the case of subsidies and refundable advances, usually subject to competition processes, the main variable elements the company has to work with are the following:

- ▶ Differing date of start (publication of orders). The same funding may be published on different dates in different years so staying alert and ready is important.
- ▶ Short time to submit projects. Once the call has been published in the according official journal, companies have to submit their applications within short time. Prepared companies will be able to submit adequate projects within few weeks.
- ▶ Long resolution period. The different administrations may take a long time (i.e. months) to issue a final resolution that allows the company to know if it has been given funding.

► Short execution period. Companies have to execute the project (and thus spend 100% of eligible funds) over a given period, but the company often needs to start the project before knowing if it will be given funding or not. If it waits, it may not have enough time to fully execute the project. Otherwise, if it decides to start it can turn out to be left without funding.

► Long payment period. Several months may pass from the moment a company finishes the project to the time funding is finally paid out. In some cases an advance payment may be asked for though a financial guarantee will usually be necessary to obtain it, which is also a slow process.

If subsidised loans are subject to competition, the disadvantages may be the same as those mentioned for subsidies. In case the call is open (i.e. loans are awarded as companies submit their application) it may happen that there is a long resolution period (months) if aid is given through public bodies.

A proposal for approaching R&D&I funding

Despite this seeming complexity, it is not difficult to receive and manage funding. In the following we will show some key aspects for setting out an according strategy. The fact is that there is an increasing number of companies that manage to fund a considerable part of their R&D&I efforts with public support.

The most common error of SMEs is to make a first attempt to «see what comes out», usually without devoting enough time nor resources to it. When they do not receive funding for different reasons (mainly because they are submitting projects that do not comply with requirements or because they are not competitive enough)

they argue that it is too difficult and forget about it. This error plus the poor use of public R&D&I aid in general is due to an incorrect focus of some companies that could be summarised in a couple of sentences:

► «How can we get subsidies for things the company already does?»

► «Since the company does R&D, we need to get subsidies.»

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As we said at the beginning, public aid intends to increase overall R&D&I, which requires a different approach. Public aid is an opportunity to do a quantum leap in R&D&I. However, companies could carry out the following activities to reduce the aforementioned disadvantages:

► Planning and dividing R&D&I into three project types:

I. Strategic: in this case, funding can only be obtained if it leads to an increased R&D&I effort on behalf of the company and public support is considered necessary

II. Big projects: projects requiring massive investment, often implemented together with other companies or technology or research centres and only feasible with a minimum level of public aid

III. Joint projects with other organisations: companies may be offered to participate in joint projects that, despite not being strategic to the company, may be of big value as to knowledge and experience

- ▶ Identifying calls for which they are eligible
- ▶ Identifying other organisations that can collaborate in concrete projects
- ▶ Making an objective aid budget that should be included into the overall company budget under different scenarios as it requires a different degree of R&D&I investment according to how much aid is received
- ▶ Allocating required resources, both internal and external, to meet the expected targets as to receiving aid

Like making income, receiving public funding is nothing else than just another business process, with a given degree of uncertainty but manageable as any other.

Companies may seek advice with specialised consultants. There is also funding for preparing R&D&I projects that facilitate planning and the submission of applications.

The company needs to plan projects and funding and be aware of calls for funding. The calls are not always published on the officially planned date. Together with short submission deadlines, this is a reason for which companies that are generally unprepared miss opportunities.

Companies not having such capacities may seek advice with specialised consultants. There is also funding for preparing R&D&I projects that facilitate planning and the submission of applications.

On what things does aid depend?

Current regulations on R&D&I funding limit public aid to entrepreneurial projects according

to several parameters. It is therefore important to understand these concepts in order to have realistic expectations of the funding a company can obtain.

- ▶ Project type: industrial research, experimental development, process innovation, organisational innovation.
- ▶ Eligible budget: out of the overall budget of the project submitted by a company, the administration needs to assess what positions are actually eligible. For instance, if a company buys a machine with an operating life of five years and the period to execute the project submitted is of one year, only 20% of the cost of the machine will be considered eligible in case it is used exclusively for R&D&I. Eligible positions may be different according to each funding scheme. Aid orders usually fix a minimum eligible budget.
- ▶ Maximum intensity: maximum subsidy rate a company may obtain from the eligible budget. It depends on different factors such as the project or company type or if it is an individual or joint project. This limit affects all subsidies a company receives for a given project. Although many companies submit the same project to different calls managed by different bodies, the funding bodies and the companies need to make sure that in no case the maximum rate is exceeded. Coordination between different administrations is becoming ever tighter and allows to easier detect an accumulation of aid.
- ▶ Awarded subsidy: in the case of financial instruments (e.g. loans), the awarded sum is higher than the awarded subsidy (gross equivalent aid). In case of funding given by means of a competition process, the projects with the worst grading will probably not receive any aid while the best could obtain the maximum intensity.
- ▶ Justification: a company needs to produce before the administration a justification for 100% of eligible positions (eligible budget). The usual requirement are invoices and receipts, the in-

voice date being within the period set by the aid scheme, as well as a technical report.

► Subsidy received: finally, the amount a company receives. If it is not possible to justify 100% of the aid, those positions not being totally justified will be reduced proportionally.

Unfamiliarity with these concepts usually causes frustration at the company. To set up an objective budget, an estimate of what the company can realistically receive is necessary, which requires knowing about the competency in aid schemes to which the company applies (awarded funding, submitted applications), the changes of requirements in each scheme as well as the increase or decrease of the annual scheme budget and of the number of calls.

Conclusion

Public R&D&I funding available to companies is an opportunity to do a quantum leap in investment. Obtaining such aid is just another business process. Companies need to make their project planning, a budget for obtaining aid and adequate follow-up.

Companies missing such opportunities lose competitiveness as other competitors, both local and European, do take them.

For any further information please refer to:
ACC1Ó CIDEM-COPCA
www.cidem.com
Tel. 93 476 72 00

MARC LLOVERAS

Director of SICOOP, Cooperative Investment Society. Former manager of the Invertec risk capital fund. Degree in Computer Sciences at the Polytechnic University of Catalonia and MBA at the Ramon Llull La Salle University. He held different positions at Accenture before joining the risk capital branch as investment manager at Granville Baird Capital Partners. In 2002 he joined Invertec to create and manage this risk capital fund.



Notes

1. Community framework for state aid for R&D&I: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2006:323:0001:0026:EN:PDF>.
2. These figures do not apply in all cases as the community framework provides for different limits shown on this chart, according to a set of parameters.
3. *Intensity of aid*: gross amount of aid given as a percentage on eligible project costs. All amounts stated are before taxes or other deductions. When aid is awarded in any other form than a subsidy, its amount is considered to be equivalent to a subsidy.
4. *Industrial research*: planned research or critical studies aimed at acquiring new knowledge and skills that can be useful for developing new products, processes or services or that allow to improve considerably those already in place. It includes creating components of complex systems that are needed for industrial research, especially the validation of overall technology. Some types of prototypes are exempt.
5. *Experimental development*: acquisition, configuration and use of existing scientific, business or other knowledge with the aim of setting up plans and structures or layouts of new, modified or improved products, processes or services. Related activities may include the elaboration of projects, layouts, plans and other types of documentation, as long as it is not for commercial use. It further includes the development of certain types of prototypes and pilot projects as well as experimental production and trial of products, processes and services, as long as they are not used for industrial applications or commercial purposes. Experimental development does not include usual or regular modifications on existing products, production lines, manufacturing processes, services or any other current activity, even if these modifications may be an improvement.
6. *Innovation related to processes*: application of a new or significantly improved production or supplying method (including significant change in technology, equipment or IT programmes). However, minor changes or improvements, increase of production or service capacities by means of introducing manufacturing or logistic systems very similar to those in place, termination of a process, capital replacement or enlargement, changes exclusively due to variations of factor prices, customisation, seasonal or other regular changes and the sale of new or significantly improved products are not considered innovations.
7. *Innovation related to organisation*: application of a new organisational method to commercial practices, site organisation or external relations of the company. However, changes in commercial practices, site organisation or external relations based on organisational methods used at the company, changes of management strategy, mergers and acquisitions, termination of a process, capital replacement or enlargement, changes exclusively due to variations of factor prices, customisation, seasonal or other regular changes and the sale of new or significantly improved products are not considered innovations.
8. «The main concern related to R&D&I aid to undertakings is that rival undertakings' dynamic incentives to invest are distorted and possibly reduced. When an undertaking receives aid, this generally strengthens its position on the market and reduces the return on investment for other undertakings.» Community framework for state aid for R&D&I.
9. State aid in the form of guarantees. Commission notice on the application of Articles 87 and 88 of the EC Treaty to state aid in the form of guarantees [Official Journal C 71 of 11.03.2000]: <http://europa.eu/scadplus/leg/en/lvb/l26083.htm>.
10. Community guidelines on state aid to promote risk capital investments in small and medium-sized enterprises (2006/C194/02): <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2006:194:0002:0021:EN:PDF>.
11. Community strategic guidelines on cohesion (2006/702/EC): http://ec.europa.eu/regional_policy/sources/docoffic/2007/osc/l_29120061021en00110032.pdf.
12. Communication from the Commission on the revision of the method for setting the reference and discount rates (2008/C 14/02): <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2008:014:0006:01:EN:HTML>.
13. CIDEM Directory of Business Angels Networks: <http://www.cidem.com/cidem/eng/networks/xip/directori/index.jsp>.
14. Funding and Subsidies Database, FISUB: <http://www.cidem.com/cidem/eng/services/financing/bbddajuts/index.jsp>; <http://www.gencat.cat/finempresa>.